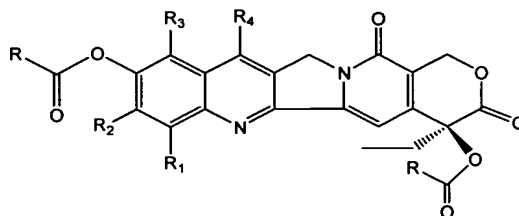


AMENDMENTS TO THE CLAIMS

1.-54. (Canceled)

55. (New) A di-ester derivative of camptothecin having the following general structure:



wherein

R_1 , R_2 , R_3 , and R_4 , which can be the same or different, are hydrogen, halogen, C_1 - C_{20} alkyl, C_1 - C_8 alkoxy, C_4 - C_{20} aryl or C_1 - C_{20} silyl,

each R can be the same or different and is C_1 - C_{30} alkyl, C_2 - C_{22} alkenyl, C_4 - C_{30} aryl, $(CH_2)_nOR_5$, $(CH_2)_nSR_5$, $(CH_2)_nNR_5R_6$ or $(CH_2)_nCOR_7$,

wherein,

R_5 and R_6 , which can be the same or different, are C_1 - C_8 alkyl, C_2 - C_6 alkenyl or C_4 - C_{10} aryl,

R_7 is hydroxy, C_1 - C_{20} alkyl, C_1 - C_6 alkenyl, C_1 - C_6 alkoxy, C_4 - C_{20} aryl, or NR_8R_9 ,

wherein,

R_8 and R_9 , which can be the same or different, are C_1 - C_6 alkyl,

and n is an integer of 1 to 8,

or a pharmaceutically acceptable salt thereof.

56. (New) A di-ester derivative of claim 55 wherein each R can be the same or different and is C_1 - C_{20} alkyl, C_2 - C_6 alkenyl, or C_4 - C_{20} aryl.

57. (New) A pharmaceutical composition comprising an effective amount of the camptothecin di-ester derivative of claim 55 and a pharmaceutically acceptable carrier or diluent.

58. (New) A pharmaceutical composition comprising an effective amount of the camptothecin di-ester derivative of claim 56 and a pharmaceutically acceptable carrier or diluent.

59. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 , R_3 , and R_4 is H, and R is C_3 - C_{30} alkyl.

60. (New) The di-ester derivative of claim 56, wherein each of R_1 , R_2 , R_3 , and R_4 is H, and R is C_1 - C_{20} alkyl.

61. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 , R_3 , and R_4 is H, and R is C_2 - C_{22} alkenyl.

62. (New) The di-ester derivative of claim 56, wherein each of R_1 , R_2 , R_3 , and R_4 is H, and R is C_2 - C_6 alkenyl.

63. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 , R_3 and R_4 is H, and R is $(CH_2)_nOR_5$,

wherein,

R_5 is C_1 - C_6 alkyl, C_2 - C_6 alkenyl, or C_4 - C_{10} aryl, and

n is 1 or 2.

64. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 , R_3 and R_4 is H, and R is $(CH_2)_nSR_5$,

wherein,

R_5 is C_1 - C_6 alkyl, C_2 - C_6 alkenyl, or C_4 - C_{10} aryl, and

n is 1 or 2.

65. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 , R_3 and R_4 is H, and R is $(CH_2)_nNR_5R_6$,

wherein,

R_5 and R_6 are independently, C_1 - C_6 alkyl, C_2 - C_6 alkenyl, or C_4 - C_{10} aryl, and

n is 1 or 2.

66. (New) The di-ester derivative of claim 55, wherein each of R₁, R₂, R₃ and R₄ is H, and R is (CH₂)_nCOR₇,

wherein,

R₇ is hydroxy, C₁–C₆ alkyl, C₂–C₆ alkenyl, or C₄–C₁₀ aryl, and

n is 2 to 4.

67. (New) The di-ester derivative of claim 55, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is C₁–C₃₀ alkyl.

68. (New) The di-ester derivative of claim 56, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is C₁–C₂₀ alkyl.

69. (New) The di-ester derivative of claim 55, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is C₂–C₂₂ alkenyl.

70. (New) The di-ester derivative of claim 56, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is C₂–C₆ alkenyl.

71. (New) The di-ester derivative of claim 55, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is C₄–C₃₀ aryl.

72. (New) The di-ester derivative of claim 56, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is C₄–C₂₀ aryl.

73. (New) The di-ester derivative of claim 55, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is (CH₂)_nOR₅,

wherein,

R₅ is C₁–C₆ alkyl, C₂–C₆ alkenyl, or C₄–C₁₀ aryl, and

n is 1 or 2.

74. (New) The di-ester derivative of claim 55, wherein each of R₁, R₂ and R₃ is H, R₄ is CH₂CH₃, and R is (CH₂)_nSR₅,

wherein,

R₅ is C₁–C₆ alkyl, C₂–C₆ alkenyl, or C₄–C₁₀ aryl, and

n is 1 or 2.

75. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is CH_2CH_3 , and R is $(\text{CH}_2)_n\text{NR}_5\text{R}_6$,

wherein,

R_5 and R_6 are independently, $\text{C}_1\text{--C}_6$ alkyl, $\text{C}_2\text{--C}_6$ alkenyl, or $\text{C}_4\text{--C}_{10}$ aryl, and n is 1 or 2.

76. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is CH_2CH_3 , and R is $(\text{CH}_2)_n\text{COR}_7$,

wherein,

R_7 is hydroxy, $\text{C}_1\text{--C}_6$ alkyl, $\text{C}_2\text{--C}_6$ alkenyl, or $\text{C}_4\text{--C}_{10}$ aryl, and n is 2 to 4.

77. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $\text{C}_1\text{--C}_{30}$ alkyl.

78. (New) The di-ester derivative of claim 56, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $\text{C}_1\text{--C}_{20}$ alkyl.

79. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $\text{C}_2\text{--C}_{22}$ alkenyl.

80. (New) The di-ester derivative of claim 56, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $\text{C}_2\text{--C}_6$ alkenyl.

81. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $\text{C}_4\text{--C}_{30}$ aryl.

82. (New) The di-ester derivative of claim 56, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $\text{C}_4\text{--C}_{20}$ aryl.

83. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $\text{Si}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$, and R is $(\text{CH}_2)_n\text{OR}_5$;

wherein,

R_5 is C_1-C_6 alkyl, C_2-C_6 alkenyl, or C_4-C_{10} aryl, and
 n is 1 or 2.

84. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $Si(CH_3)_2C(CH_3)_3$, and R is $(CH_2)_nSR_5$,

wherein,

R_5 is C_1-C_6 alkyl, C_2-C_6 alkenyl, or C_4-C_{10} aryl, and
 n is 1 or 2.

85. (New) The di-ester derivative of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $Si(CH_3)_2C(CH_3)_3$, and R is $(CH_2)_nNR_5R_6$,

wherein,

R_5 and R_6 are independently, C_1-C_6 alkyl, C_2-C_6 alkenyl, or C_4-C_{10} aryl, and
 n is 1 or 2.

86. (New) The di-ester of claim 55, wherein each of R_1 , R_2 and R_3 is H, R_4 is $Si(CH_3)_2C(CH_3)_3$, and R is $CH_2)_nCOR_7$,

wherein,

R_7 is hydroxy, C_1-C_6 alkyl, C_2-C_6 alkenyl, or C_4-C_{10} aryl, and
 n is 2 to 4.

87. (New) The di-ester derivative of claim 55, wherein R_1 is $CH_2N(CH_3)_2$, each of R_2 , R_3 and R_4 is H, and R is C_1-C_{30} alkyl.

88. (New) The di-ester derivative of claim 56, wherein R_1 is $CH_2N(CH_3)_2$, each of R_2 , R_3 and R_4 is H, and R is C_1-C_{20} alkyl.

89. (New) The di-ester derivative of claim 55, wherein R_1 is $CH_2N(CH_3)_2$, each of R_2 , R_3 and R_4 is H, and R is C_2-C_{22} alkenyl.

90. (New) The di-ester derivative of claim 56, wherein R_1 is $CH_2N(CH_3)_2$, each of R_2 , R_3 and R_4 is H, and R is C_2-C_6 alkenyl.

91. (New) The di-ester derivative of claim 55, wherein R_1 is $CH_2N(CH_3)_2$, each of R_2 , R_3 and R_4 is H, and R is C_4-C_{30} aryl.

92. (New) The di-ester derivative of claim 56, wherein R_1 is $\text{CH}_2\text{N}(\text{CH}_3)_2$, each of R_2 , R_3 and R_4 is H, and R is $\text{C}_4\text{-C}_{20}$ aryl.

93. (New) The di-ester derivative of claim 55, wherein R_1 is $\text{CH}_2\text{N}(\text{CH}_3)_2$, each of R_2 , R_3 and R_4 is H, and R is $(\text{CH}_2)_n\text{OR}_5$,

wherein,

R_5 is $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_2\text{-C}_6$ alkenyl, or $\text{C}_4\text{-C}_{10}$ aryl, and

n is 1 or 2.

94. (New) The di-ester derivative of claim 55, wherein R_1 is $\text{CH}_2\text{N}(\text{CH}_3)_2$, each of R_2 , R_3 and R_4 is H, and R is $(\text{CH}_2)_n\text{SR}_5$,

wherein,

R_5 is $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_2\text{-C}_6$ alkenyl, or $\text{C}_4\text{-C}_{10}$ aryl, and

n is 1 or 2.

95. (New) The di-ester derivative of claim 55, wherein R_1 is $\text{CH}_2\text{N}(\text{CH}_3)_2$, each of R_2 , R_3 and R_4 is H, and R is $(\text{CH}_2)_n\text{NR}_5\text{R}_6$,

wherein,

R_5 and R_6 are independently, $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_2\text{-C}_6$ alkenyl, or $\text{C}_4\text{-C}_{10}$ aryl, and

n is 1 or 2.

96. (New) The di-ester derivative of claim 55, wherein R_1 is $\text{CH}_2\text{N}(\text{CH}_3)_2$, each of R_2 , R_3 and R_4 is H, and R is $(\text{CH}_2)_n\text{COR}_7$,

wherein,

R_7 is hydroxy, $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_2\text{-C}_6$ alkenyl, or $\text{C}_4\text{-C}_{10}$ aryl, and

n is 2 to 4.

97. (New) A method to inhibit the enzyme topoisomerase I in an animal in need thereof comprising administering to the animal an effective amount of a composition comprising at least one di-ester derivative of claim 55.

98. (New) A method to inhibit the enzyme topoisomerase I in an animal in need thereof comprising administering to the animal an effective amount of a composition comprising at least one di-ester derivative of claim 56.

99. (New) A method to treat cancer in a patient comprising administering a composition comprising at least one di-ester derivative of claim 55 to said patient in an effective amount to treat said cancer.

100. (New) A method to treat cancer in a patient comprising administering a composition comprising at least one di-ester derivative of claim 56 to said patient in an effective amount to treat said cancer.

101. (New) The method of claim 99, wherein said cancer is lung, breast, colon, prostate, melanoma, pancreas, stomach, liver, brain, kidney, uterus, cervix, ovaries, urinary tract, gastrointestinal, or leukemia.

102. (New) The method of claim 100, wherein said cancer is lung, breast, colon, prostate, melanoma, pancreas, stomach, liver, brain, kidney, uterus, cervix, ovaries, urinary tract, gastrointestinal, or leukemia.

103. (New) The method of claim 99, wherein said cancer is solid tumor or blood borne tumor.

104. (New) The method of claim 100, wherein said cancer is solid tumor or blood borne tumor.

105. (New) The method of claim 99, wherein said composition is administered orally, parenterally, intramuscularly, transdermally or by an airborne delivery system.

106. (New) The method of claim 100, wherein said composition is administered orally, parenterally, intramuscularly, transdermally or by an airborne delivery system.

107. (New) The method of claim 99, wherein said composition is a nanoparticle containing said at least one di-ester of camptothecin.

108. (New) The method of claim 100, wherein said composition is a nanoparticle containing said at least one di-ester of camptothecin.

This listing of claims replaces all prior versions, and listings, of claims in the application.